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LOWE HAUPTMAN HAM & BERNER, LLP
1700 DIAGONAL ROAD
SUITE 300
ALEXANDRIA, VA 22314

EXAMINER	
WOOD, JR, STEVEN A	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/566,830	IHM ET AL.	
	Examiner	Art Unit	
	STEVEN WOOD	2416	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 December 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-45* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-9* is/are allowed.

6)☒ Claim(s) *10-45* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 January 2006* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1. The instant application having Application No. 10/566830 filed on July 30, 2004 is presented for examination by the examiner.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: S406. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

4. **Claims 18, 19, 28, 29, 30, 33, 34, 43, 44 & 45** are objected to as being dependent upon rejected base claims, but would be allowable if rewritten in independent form including all of the limitations of the base claims and any intervening claims.

Allowable Subject Matter

5. **Claims 1 – 9** allowed.

6. The following is a statement of reasons for the indication of allowable subject matter: Examiner found all limitations required by claim 1 except for the limitation of setting a reverse activation control bit based on the comparison of an active number of users with a threshold user number defining an allowable limit of active users. The closest art, Kim, et al., (US 20030119452 A1) discloses comparing the number of user equipments existing in a cell region to a threshold, but does not disclose that threshold as defining an allowable limit of active users or setting a reverse activation control bit dependent on the comparison. Therefore, claim 1 and all dependent claims are allowable.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. **Claims 31, 32, 35, 36, 38 & 39** are rejected under 35 U.S.C. 102(b) as being anticipated by Jain, et al., (US 20020186657 A1) (hereinafter Jain).

9. Regarding **claim 31**, Jain discloses a system for controlling a reverse link rate in a CDMA 1xEV-DO mobile communication system, comprising: at least one mobile terminal capable of transceiving packet data with the reverse link rate changed based on a reverse activation control bit to be received, (Figs. 2 & 3; paragraph 16; congestion control at an (**radio)** access network in a wireless communication system adapted for packetized transmission (**capable of transceiving packet data**); paragraph 39; each access terminal (**at least one mobile terminal)** in communication with the access network uses the congestion bit (CB **(reverse activation control bit (RACB)))** information for control of a reverse link (RL) transmission data rate (**reverse link rate changed based on RACB to be received)**), a radio access network for measuring a value of rise-over-thermal (ROT) of the system to obtain a measured ROT value, (Figs. 2 & 3; paragraph 41; (**radio)** access network measures a function of Rise Over Thermal, ROT (**to obtain a measured ROT value)**), determining the reverse activation control bit by using at least one of the measured ROT value, the number of active users who are carrying out communication and a cell self-interference rate, (Figs. 2 & 3; paragraph 42; access network compares the measured metric, such as ROT, to the outer loop threshold. If the measured metric is greater than the outerloop threshold, the congestion bit is set **(CB = 1)** at step 190, else (**if the measured ROT is smaller than or equal to the threshold ROT**) the congestion bit is cleared (**RACB = 0)**), transmitting the reverse activation control bit to control the reverse link rate, (paragraph 42; access network transmits the congestion bit), and a mobile switching center

connected to the radio access network for performing incoming and outgoing call process of the mobile terminal and also connected to be linked with a data communication network, (Fig. 2; paragraph 24; Modem pool transceivers and modem pool controllers **(mobile switching center)** are parts of **(connected to)** a network called the **(Radio)** Access Network. An access network transports data packets between multiple access terminals **(performs incoming and outgoing call process of the mobile terminal)**. The access network may be further connected to additional networks outside the access network, such as a corporate intranet or the Internet **(mobile switching center also connected to be linked with a data communication network)**).

10. Regarding **claim 32**, the rejection of claim 31 is incorporated and only further limitations will be addressed. Jain discloses the system, wherein the reverse activation control bit is set to have a value of 0 if the measured ROT value is smaller than or equal to a threshold ROT which represents an allowable limit of the ROT, (Figs. 2 & 3; paragraph 42; access network compares the measured metric, such as ROT **(measured ROT)**, to the outerloop threshold **(Threshold ROT)**. If the measured metric is greater than the outerloop threshold, the congestion bit is set at step 190, else **(if the measured ROT is smaller than or equal to the threshold ROT)** the congestion bit is cleared **(RACB = 0)**).

11. Regarding **claim 35**, the rejection of claim 31 is incorporated and only further limitations will be addressed. Jain discloses the system, wherein the mobile terminal lowers the reverse link rate if the reverse activation control bit with a value of 1 is transmitted, (paragraph 39; when the

CB is set **(RACB = 1)**, each access terminal will lower the transmission data rate **(mobile terminal lowers the reverse link rate if RACB = 1 is transmitted))**.

12. Regarding **claim 36**, the rejection of claim 31 is incorporated and only further limitations will be addressed. Jain discloses the system, wherein the mobile terminal includes a PDA (Personal Digital Assistant), a cellular phone, a PCS (Personal Communication Service) phone, a hand-held PC, a GSM (Global System for Mobile) phone, a W-CDMA (Wideband CDMA) phone, an EV-DO phone, an EV-DV (Data and Voice) phone and a MBS (mobile Broadband System) phone, (Jain: Fig. 1; paragraph 25; An access terminal may further be any of a number of types of devices including but not limited to PC card, compact flash, external or internal modem, or wireless or wireline phone; paragraph 27; terminals 106 in the coverage area may be fixed (i.e., stationary) or mobile (**cellular phone**)).

13. Regarding **claim 38**, the rejection of claim 31 is incorporated and only further limitations will be addressed. Jain discloses the system, wherein the data communication network includes a PSDN (Public Switched Data Network), an ISDN (Integrated Services Digital Network), a B-ISDN (Broad ISDN), an IN (Intelligent Network), a PLMN (Public Land Mobile Network) and Internet, (paragraph 16; access network may be further connected to additional networks outside the access network, such as a corporate intranet or the Internet, and may transport data packets between each access terminal and such outside networks).

14. Regarding **claim 39**, the rejection of claim 31 is incorporated and only further limitations will be addressed. Jain discloses the system, wherein the ROT value is obtained by subtracting a thermal noise power of the system from a received power measured at each antenna end of a wireless base station, (paragraph 33; measure of the cell/sector congestion is the total received power at the base station. A ratio of the total received power at the base station to the thermal noise (**subtracting a thermal noise power of the system from a received power measured at said each antenna end**) gives a normalized measure of the congestion and is referred to as Rise-Over-Thermal, ROT).

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

16. **Claims 10, 11, 14, 15, 16, 18 & 19** are rejected under 35 U.S.C. 103(a) as being unpatentable over Jain, in view of Kim, et al., (US 20020141349 A1) (hereinafter Kim).

17. Regarding **claim 10**, Jain discloses a method for controlling a reverse link rate by using a cell self-interference rate in a CDMA 1xEV-DO mobile communication system, comprising the steps of: (a) measuring a value of rise-over-thermal (ROT) at each antenna end of a wireless base station to obtain a measured ROT value, (Figs. 2, 3 & 7; paragraph 55; congestion metric

measurement unit 508 may measure the Rise-Over-Thermal (ROT) **(measuring a value of rise-over-thermal (ROT))** of received signals. The congestion metric measurement unit 508 provides the measurement results **(to obtain a measured ROT value)** to outerloop threshold adjustment unit 504 and comparator 510; Jain does not specifically teach *measuring ROT at each antenna end of a wireless base station*. However, at the time of the invention it is well known and expected in the art that one of ordinary skill would understand that ROT is inherently measured at the antenna ends of a wireless base station. Hen discloses in US patent application no. 10/733,990 that a base station measures a ROTm (measured ROT value), found by subtracting (dB basis) thermal noise power (Rx Power_Thermal) of a base station system from total reception power (Rx Power_Total) received from an antenna of a reception end of a base station **(measuring a value of ROT at antenna ends of a base station inherent)** (Hen: Fig. 1; paragraph 49)), (b) comparing the measured ROT value with a threshold ROT which defines an allowable limit of the ROT, (Figs. 2 & 3; paragraph 42; access network compares the measured metric, such as ROT **(measured ROT)**, to the outerloop threshold (**threshold ROT**, **which defines an allowable limit of the ROT)**), (c) setting a reverse activation control bit as 0 to be transmitted to a mobile terminal if the comparison result in step (b) reveals that the measured ROT value is smaller than or equal to the threshold ROT, (Figs. 2 & 3; paragraph 42; if the measured metric is greater than the outerloop threshold, the congestion bit is set at step 190, else **(if the measured ROT is smaller than or equal to the threshold ROT)** the congestion bit is cleared **(RACB = 0)**. The access network transmits **(to mobile terminals)** the congestion bit).

However, Jain does not explicitly teach *the method (d) comparing the cell self-interference rate with a threshold interference rate which defines an allowable limit of the cell*

self-interference rate if the comparison result in step (b) reveals that the measured ROT value is greater than the threshold ROT, (e) setting the reverse activation control bit as 0 to be transmitted to the mobile terminal if the comparison result in step (d) reveals that the cell self-interference rate is smaller than or equal to the threshold interference rate, and (f) setting the reverse activation control bit as 1 to be transmitted to the mobile terminal if the comparison result in step (d) reveals that the cell self-interference rate is greater than the threshold interference rate.

Kim explicitly discloses (d) comparing the cell self-interference rate with a threshold interference rate which defines an allowable limit of the cell self-interference rate if the comparison result in step (b) reveals that the measured ROT value is greater than the threshold ROT, (paragraph 65; First, the base station detects and determines a level of interference (**cell self-interference rate**) among all communication traffic channels (S51). The detected interference level is compared with a threshold so that the load on the reverse link can be approximated (S52, S53)), (e) setting the reverse activation control bit as 0 to be transmitted to the mobile terminal if the comparison result in step (d) reveals that the cell self-interference rate is smaller than or equal to the threshold interference rate, (Fig. 5; paragraph 46; determinator 34 determines a transmission data rate adjust information (e.g., increase, decrease or maintain) based on the reverse link load determined by the comparator 33; paragraph 59; based upon the transmission data rate adjust information, if the current transmission data rate is to be increased **(when comparator determines a cell self-interference rate smaller than the threshold interference rate**), the base station sets the RCB to "INCREASE" **(setting reverse activation control bit to 0)**), (f) setting the reverse activation control bit as 1 to be transmitted to the mobile

terminal if the comparison result in step (d) reveals that the cell self-interference rate is greater than the threshold interference rate, (Fig. 5; paragraph 46; determinator 34 determines a transmission data rate adjust information (e.g., increase, decrease or maintain) based on the reverse link load determined by the comparator 33; paragraph 59; and if the current transmission data rate is to be decreased **(when comparator determines a cell self-interference rate greater than the threshold interference rate)**, the base station sets the RCB to "DECREASE." **(setting rate control bit (RCB) or reverse activation control bit to 1)**).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the teaching of Jain by incorporating the teaching of Kim to control data transmission (transfer) rates between a base station and mobile stations served by the base station so that data throughput is advantageously increased (Kim; paragraph 1).

18. Regarding **claim 11**, the rejection of claim 10 is incorporated and only further limitations will be addressed. The combined teaching of Jain and Kim discloses the method, wherein the ROT value is obtained by subtracting a thermal noise power of the system from a received power measured at said each antenna end, (Jain: paragraph 33; measure of the cell/sector congestion is the total received power at the base station. A ratio of the total received power at the base station to the thermal noise **(subtracting a thermal noise power of the system from a received power measured at said each antenna end)** gives a normalized measure of the congestion and is referred to as Rise-Over-Thermal, ROT).

19. Regarding **claim 14**, the rejection of claim 10 is incorporated and only further limitations will be addressed. The combined teaching of Jain and Kim discloses the method, wherein the cell self-interference rate is obtained by using an amount of load generated by packets normally received from the mobile terminal, (Kim: Fig. 3; paragraph 42; mobile can comprise a transceiver, which transmits packet data on the reverse link **(packets normally received from the mobile terminal)**; paragraph 43; base station 30 comprises a reception processor 31, an interference level detector 32, a comparator 33, a determinator 34, and a transmission processor 35. The reception processor 31 processes (e.g., demodulates) the signals received from mobiles (not shown) via a reception antenna A3. The interference level detector 32 receives the processed signals from the reception processor 31 for estimating and/or detecting a level of signal interference **(cell self-interference rate)** related to the processed signals; paragraph 46; after the interference level detector 32 detects the signal interference, the comparator 33 compares the detected level of signal interference **(obtained by using an amount of load generated)** with a threshold value in order to estimate (determine) the load on the reverse link).

20. Regarding **claim 15**, the rejection of claim 10 is incorporated and only further limitations will be addressed. The combined teaching of Jain and Kim discloses the method, wherein the mobile terminal lowers the reverse link rate if the reverse activation control bit with a value of 1 is transmitted in step (f), (Jain: paragraph 39; when the CB is set **(RACB = 1)**, each access terminal will lower the transmission data rate **(mobile terminal lowers the reverse link rate if RACB = 1 is transmitted)**).

21. Regarding **claim 16**, the rejection of claim 10 is incorporated and only further limitations will be addressed. The combined teaching of Jain and Kim discloses the method, wherein the mobile terminal includes a PDA (Personal Digital Assistant), a cellular phone, a PCS (Personal Communication Service) phone, a hand-held PC, a GSM (Global System for Mobile) phone, a W-CDMA (Wideband CDMA) phone, an EV-DO phone, an EV-DV (Data and Voice) phone and a MBS (mobile Broadband System) phone, (Jain: Fig. 1; paragraph 25; An access terminal may further be any of a number of types of devices including but not limited to PC card, compact flash, external or internal modem, or wireless or wireline phone; paragraph 27; terminals 106 in the coverage area may be fixed (i.e., stationary) or mobile (**cellular phone**)).

22. **Claim 12** is rejected under 35 U.S.C. 103(a) as being unpatentable over the combined teaching of Jain and Kim, in view of Chung.

23. Regarding **claim 12**, the rejection of claim 11 is incorporated and only further limitations will be addressed. The combined teaching of Jain and Kim does not explicitly teach *the method, wherein the thermal noise power is measured at a state where a reverse transmission of the mobile terminal is ceased.*

Chung explicitly discloses the method, wherein the thermal noise power is measured at a state where a reverse transmission of the mobile terminal is ceased, (paragraph 75; if the system can force all mobile stations (MS's) to become silent (e.g., turning off their transmitters **(reverse transmissions of the mobile terminal is ceased)**) during predetermined time intervals (e.g., a few milliseconds every 10 minutes), then it is possible to measure amplified thermal noise).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combined teaching of Jain and Kim by incorporating the teaching of Chung to increase forward and/or reverse link capacity of a cellular wireless system where base stations are distributed, to dynamic allocation of capacity to each sector based on actual demand, which reduces the total capacity requirement, and to share capacity among multiple BS's (Chung; paragraph 9).

24. **Claims 13** is rejected under 35 U.S.C. 103(a) as being unpatentable over the combined teaching of Jain and Kim, in view of Chheda, et al., (US 7120447 B1) (hereinafter Chheda).

25. Regarding **claim 13**, the rejection of claim 10 is incorporated and only further limitations will be addressed. The combined teaching of Jain and Kim does not explicitly teach *the method, wherein the measured ROT value is a largest value among ROT values measured at said each antenna end of the wireless base station*.

Chheda explicitly discloses the method, wherein the measured ROT value is a largest value among ROT values measured at said each antenna end of the wireless base station, (Fig. 4; Col. 8, lines 15 – 16; BSC determines which sector **(at said each antenna end of the wireless base station)** in communication with the mobile station (MS) has the highest measured ROT **(measured ROT value is a largest value among ROT values measured)**).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combined teaching of Jain and Kim by incorporating the teaching of Chheda to dynamically adjust vocoder rates based on system load metrics (Chheda; Col. 2, lines 43 – 44).

26. **Claim 17** is rejected under 35 U.S.C. 103(a) as being unpatentable over the combined teaching of Jain and Kim, in view of Bae.

27. Regarding **claim 17**, the rejection of claim 10 is incorporated and only further limitations will be addressed. The combined teaching of Jain and Park does not explicitly teach *the method, wherein the mobile terminal transmits packet data to the wireless base station on a time slot basis through a reverse traffic channel.*

Bae explicitly discloses the method, wherein the mobile terminal transmits packet data to the wireless base station on a time slot basis through a reverse traffic channel (paragraph 11; if the changed data rate is lower than a data rate set in an reverse rate limit (RRL) message, the mobile station (MS) transmits data on the set data rate 32 slots (53.33 ms) later **(on a time slot basis)**; paragraph 60; MS transmits a reverse packet **(transmits packet data through a reverse traffic channel)** to the BS **(to the wireless base station)**).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combined teaching of Jain and Kim by incorporating the teaching of Bae to provide a method of efficiently controlling reverse data rate in a mobile communication system, for shortening time required to reach the full utilization of a reverse link in a mobile communication system supporting data transmission, for individually controlling the reverse data

rates of MSs in a mobile communication system supporting data transmission, and for efficiently controlling the overload of a BS by allowing an MS to flexibly increment or decrement a reverse data rate (Bae; paragraphs 20 – 23).

28. **Claims 20, 21, 24 – 26, 28 & 30** are rejected under 35 U.S.C. 103(a) as being unpatentable over Jain, in view of Kim.

29. Regarding **claim 20**, Jain discloses a method for controlling a reverse link rate in a CDMA 1xEV-DO mobile communication system, comprising the steps of: (a) measuring a value of rise-over-thermal (ROT) at each antenna end of a wireless base station to obtain a measured ROT value, (Figs. 2, 3 & 7; paragraph 55; congestion metric measurement unit 508 may measure the Rise-Over-Thermal (ROT) (**measuring a value of rise-over-thermal (ROT)**) of received signals. The congestion metric measurement unit 508 provides the measurement results (**to obtain a measured ROT value**) to outerloop threshold adjustment unit 504 and comparator 510; Jain does not specifically teach *measuring ROT at each antenna end of a wireless base station*. However, at the time of the invention it is well known and expected in the art that one of ordinary skill would understand that ROT is inherently measured at the antenna ends of a wireless base station. Hen discloses in US patent application no. 10/733,990 that a base station measures a ROTm (measured ROT value), found by subtracting (dB basis) thermal noise power (Rx Power_Thermal) of a base station system from total reception power (Rx Power_Total) received from an antenna of a reception end of a base station (**measuring a value of ROT at antenna ends of a base station inherent**) (Hen: Fig. 1; paragraph 49)), (b) comparing the

measured ROT value with a threshold ROT which defines an allowable limit of the ROT, (Figs. 2 & 3; paragraph 42; access network compares the measured metric, such as ROT (**measured ROT**), to the outerloop threshold (**threshold ROT, which defines an allowable limit of the ROT**)), (c) setting a reverse activation control bit as 0 to be transmitted to a mobile terminal if the comparison result in step (b) reveals that the measured ROT value is smaller than or equal to the threshold ROT, (Figs. 2 & 3; paragraph 42; if the measured metric is greater than the outerloop threshold, the congestion bit is set at step 190, else (**if the measured ROT is smaller than or equal to the threshold ROT**) the congestion bit is cleared (**RACB = 0**). The access network transmits (**to mobile terminals**) the congestion bit).

However, Jain does not explicitly teach *the method (d) comparing the number of active users who are carrying out communication with a threshold user number which defines an allowable limit of the active users or comparing a cell self-interference rate with a threshold interference rate which defines an allowable limit of the cell self-interference rate if the comparison result in step (b) reveals that the measured ROT value is greater than the threshold ROT, (e) setting the reverse activation control bit as 0 to be transmitted to the mobile terminal if the comparison result in step (d) reveals that the number of the active users and the cell self-interference rate are smaller than or equal to the threshold user number and the threshold interference rate, respectively, (f) setting the reverse activation control bit as 1 to be transmitted to the mobile terminal if the comparison result in step (d) reveals that the number of the active users is greater than the threshold user number or the cell self-interference rate is greater than the threshold interference rate.*

Kim explicitly discloses (d) comparing the number of active users who are carrying out communication with a threshold user number which defines an allowable limit of the active users or comparing a cell self-interference rate with a threshold interference rate which defines an allowable limit of the cell self-interference rate if the comparison result in step (b) reveals that the measured ROT value is greater than the threshold ROT, (paragraph 65; First, the base station detects and determines a level of interference **(cell self-interference rate)** among all communication traffic channels (S51). The detected interference level is compared with a threshold so that the load on the reverse link can be approximated (S52, S53)), (e) setting the reverse activation control bit as 0 to be transmitted to the mobile terminal if the comparison result in step (d) reveals that the number of the active users and the cell self-interference rate are smaller than or equal to the threshold user number and the threshold interference rate, respectively, (Fig. 5; paragraph 46; determinator 34 determines a transmission data rate adjust information (e.g., increase, decrease or maintain) based on the reverse link load determined by the comparator 33; paragraph 59; based upon the transmission data rate adjust information, if the current transmission data rate is to be increased **(when comparator determines a cell self-interference rate smaller than the threshold interference rate)**, the base station sets the RCB to "INCREASE" **(setting reverse activation control bit to 0)**), (f) setting the reverse activation control bit as 1 to be transmitted to the mobile terminal if the comparison result in step (d) reveals that the number of the active users is greater than the threshold user number or the cell self-interference rate is greater than the threshold interference rate, (Fig. 5; paragraph 46; determinator 34 determines a transmission data rate adjust information (e.g., increase, decrease or maintain) based on the reverse link load determined by the comparator 33; paragraph 59; and

if the current transmission data rate is to be decreased **(when comparator determines a cell self-interference rate greater than the threshold interference rate)**, the base station sets the RCB to "DECREASE." **(setting rate control bit (RCB) or reverse activation control bit to 1))**.

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the teaching of Jain by incorporating the teaching of Kim to control data transmission (transfer) rates between a base station and mobile stations served by the base station so that data throughput is advantageously increased (Kim; paragraph 1).

30. Regarding **claim 21**, the rejection of claim 20 is incorporated and only further limitations will be addressed. The combined teaching of Jain and Kim discloses the method, wherein the ROT value is obtained by subtracting a thermal noise power of the system from a received power measured at said each antenna end, (Jain: paragraph 33; measure of the cell/sector congestion is the total received power at the base station. A ratio of the total received power at the base station to the thermal noise **(subtracting a thermal noise power of the system from a received power measured at said each antenna end)** gives a normalized measure of the congestion and is referred to as Rise-Over-Thermal, ROT).

31. Regarding **claim 24**, the rejection of claim 20 is incorporated and only further limitations will be addressed. The combined teaching of Jain and Kim discloses the system, wherein the cell self-interference rate is obtained by using an amount of load generated by packets normally received from the mobile terminal, (Kim: Fig. 3; paragraph 42; mobile can comprise a

transceiver, which transmits packet data on the reverse link **(packets normally received from the mobile terminal)**; paragraph 43; base station 30 comprises a reception processor 31, an interference level detector 32, a comparator 33, a determinator 34, and a transmission processor 35. The reception processor 31 processes (e.g., demodulates) the signals received from mobiles (not shown) via a reception antenna A3. The interference level detector 32 receives the processed signals from the reception processor 31 for estimating and/or detecting a level of signal interference **(cell self-interference rate)** related to the processed signals; paragraph 46; after the interference level detector 32 detects the signal interference, the comparator 33 compares the detected level of signal interference **(obtained by using an amount of load generated)** with a threshold value in order to estimate (determine) the load on the reverse link).

32. Regarding **claim 25**, the rejection of claim 20 is incorporated and only further limitations will be addressed. The combined teaching of Jain and Kim discloses the method, wherein the mobile terminal lowers the reverse link rate if the reverse activation control bit with a value of 1 is transmitted in step (f), (Jain: paragraph 39; when the CB is set **(RACB = 1)**, each access terminal will lower the transmission data rate **(mobile terminal lowers the reverse link rate if RACB = 1 is transmitted)**).

33. Regarding **claim 26**, the rejection of claim 20 is incorporated and only further limitations will be addressed. The combined teaching of Jain and Kim discloses the method, wherein the mobile terminal includes a PDA (Personal Digital Assistant), a cellular phone, a PCS (Personal Communication Service) phone, a hand-held PC, a GSM (Global System for Mobile) phone, a

W-CDMA (Wideband CDMA) phone, an EV-DO phone, an EV-DV (Data and Voice) phone and a MBS (mobile Broadband System) phone, (Jain: Fig. 1; paragraph 25; An access terminal may further be any of a number of types of devices including but not limited to PC card, compact flash, external or internal modem, or wireless or wireline phone; paragraph 27; terminals 106 in the coverage area may be fixed (i.e., stationary) or mobile (**cellular phone**)).

34. **Claim 22** is rejected under 35 U.S.C. 103(a) as being unpatentable over the combined teaching of Jain and Kim, in view of Chung.

35. Regarding **claim 22**, the rejection of claim 21 is incorporated and only further limitations will be addressed. The combined teaching of Jain and Park does not explicitly teach *the method, wherein the thermal noise power is measured at a state where a reverse transmission of the mobile terminal is ceased.*

Chung explicitly discloses the method, wherein the thermal noise power is measured at a state where a reverse transmission of the mobile terminal is ceased, (paragraph 75; if the system can force all mobile stations (MS's) to become silent (e.g., turning off their transmitters (**reverse transmissions of the mobile terminal is ceased**)) during predetermined time intervals (e.g., a few milliseconds every 10 minutes), then it is possible to measure amplified thermal noise).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combined teaching of Jain and Kim by incorporating the teaching of Chung to increase forward and/or reverse link capacity of a cellular wireless system where base stations are distributed, to dynamic allocation of capacity to each sector based on actual demand, which

reduces the total capacity requirement, and to share capacity among multiple BS's (Chung; paragraph 9).

36. **Claims 23** is rejected under 35 U.S.C. 103(a) as being unpatentable over the combined teaching of Jain and Kim, in view of Chheda.

37. Regarding **claim 23**, the rejection of claim 20 is incorporated and only further limitations will be addressed. The combined teaching of Jain and Kim does not explicitly teach *the method, wherein the measured ROT value is a largest value among ROT values measured at said each antenna end of the wireless base station*.

Chheda explicitly discloses the method, wherein the measured ROT value is a largest value among ROT values measured at said each antenna end of the wireless base station, (Fig. 4; Col. 8, lines 15 – 16; BSC determines which sector **(at said each antenna end of the wireless base station)** in communication with the mobile station (MS) has the highest measured ROT **(measured ROT value is a largest value among ROT values measured)**).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combined teaching of Jain and Kim by incorporating the teaching of Chheda to dynamically adjust vocoder rates based on system load metrics (Chheda; Col. 2, lines 43 – 44).

38. **Claim 27** is rejected under 35 U.S.C. 103(a) as being unpatentable over the combined teaching of Jain and Kim, in view of Bae.

39. Regarding **claim 27**, the rejection of claim 20 is incorporated and only further limitations will be addressed. The combined teaching of Jain and Kim does not explicitly teach *the method, wherein the mobile terminal transmits packet data to the wireless base station on a time slot basis through a reverse traffic channel.*

Bae explicitly discloses the method, wherein the mobile terminal transmits packet data to the wireless base station on a time slot basis through a reverse traffic channel (paragraph 11; if the changed data rate is lower than a data rate set in an reverse rate limit (RRL) message, the mobile station (MS) transmits data on the set data rate 32 slots (53.33 ms) later **(on a time slot basis)**; paragraph 60; MS transmits a reverse packet **(transmits packet data through a reverse traffic channel)** to the BS **(to the wireless base station)**).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combined teaching of Jain and Kim by incorporating the teaching of Bae to provide a method of efficiently controlling reverse data rate in a mobile communication system, for shortening time required to reach the full utilization of a reverse link in a mobile communication system supporting data transmission, for individually controlling the reverse data rates of MSs in a mobile communication system supporting data transmission, and for efficiently controlling the overload of a BS by allowing an MS to flexibly increment or decrement a reverse data rate (Bae; paragraphs 20 – 23).

40. **Claim 37** is rejected under 35 U.S.C. 103(a) as being unpatentable over Jain in view of Bae.

41. Regarding **claim 37**, the rejection of claim 31 is incorporated and only further limitations will be addressed. Jain does not explicitly teach *the method, wherein the mobile terminal transmits packet data to the wireless base station on a time slot basis through a reverse traffic channel.*

Bae explicitly discloses the method, wherein the mobile terminal transmits packet data to the wireless base station on a time slot basis through a reverse traffic channel (paragraph 11; if the changed data rate is lower than a data rate set in an reverse rate limit (RRL) message, the mobile station (MS) transmits data on the set data rate 32 slots (53.33 ms) later **(on a time slot basis)**; paragraph 60; MS transmits a reverse packet **(transmits packet data through a reverse traffic channel)** to the BS **(to the wireless base station)**).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teaching of Jain by incorporating the teaching of Bae to provide a method of efficiently controlling reverse data rate in a mobile communication system, for shortening time required to reach the full utilization of a reverse link in a mobile communication system supporting data transmission, for individually controlling the reverse data rates of MSs in a mobile communication system supporting data transmission, and for efficiently controlling the overload of a BS by allowing an MS to flexibly increment or decrement a reverse data rate (Bae; paragraphs 20 – 23).

42. **Claim 40** is rejected under 35 U.S.C. 103(a) as being unpatentable over Jain, in view of Chung.

43. Regarding **claim 40**, the rejection of claim 39 is incorporated and only further limitations will be addressed. Jain does not explicitly teach *the method, wherein the thermal noise power is measured at a state where a reverse transmission of the mobile terminal is ceased.*

Chung explicitly discloses the method, wherein the thermal noise power is measured at a state where a reverse transmission of the mobile terminal is ceased, (paragraph 75; if the system can force all mobile stations (MS's) to become silent (e.g., turning off their transmitters (**reverse transmissions of the mobile terminal is ceased**)) during predetermined time intervals (e.g., a few milliseconds every 10 minutes), then it is possible to measure amplified thermal noise).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teaching of Jain by incorporating the teaching of Chung to increase forward and/or reverse link capacity of a cellular wireless system where base stations are distributed, to dynamic allocation of capacity to each sector based on actual demand, which reduces the total capacity requirement, and to share capacity among multiple BS's (Chung; paragraph 9).

44. **Claims 41** is rejected under 35 U.S.C. 103(a) as being unpatentable over Jain, in view of Chheda.

45. Regarding **claim 41**, the rejection of claim 31 is incorporated and only further limitations will be addressed. Jain does not explicitly teach *the method, wherein the measured ROT value is a largest value among ROT values measured at said each antenna end of the wireless base station*.

Chheda explicitly discloses the method, wherein the measured ROT value is a largest value among ROT values measured at said each antenna end of the wireless base station, (Fig. 4; Col. 8, lines 15 – 16; BSC determines which sector (**at said each antenna end of the wireless base station**) in communication with the mobile station (MS) has the highest measured ROT (**measured ROT value is a largest value among ROT values measured**)).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combined teaching of Jain and Kim by incorporating the teaching of Chheda to dynamically adjust vocoder rates based on system load metrics (Chheda; Col. 2, lines 43 – 44).

46. **Claim 42** is rejected under 35 U.S.C. 103(a) as being unpatentable over Jain in view of Kim.

47. Regarding **claim 42**, the rejection of claim 31 is incorporated and only further limitations will be addressed. Jain does not explicitly teach *the system, wherein the cell self-interference rate is obtained by using an amount of load generated by packets normally received from the mobile terminal*.

Kim explicitly discloses the system, wherein the cell self-interference rate is obtained by using an amount of load generated by packets normally received from the mobile terminal, (Kim: Fig. 3; paragraph 42; mobile can comprise a transceiver, which transmits packet data on the reverse link (**packets normally received from the mobile terminal**); paragraph 43; base station 30 comprises a reception processor 31, an interference level detector 32, a comparator 33, a determinator 34, and a transmission processor 35. The reception processor 31 processes (e.g., demodulates) the signals received from mobiles (not shown) via a reception antenna A3. The interference level detector 32 receives the processed signals from the reception processor 31 for estimating and/or detecting a level of signal interference (**cell self-interference rate**) related to the processed signals; paragraph 46; after the interference level detector 32 detects the signal interference, the comparator 33 compares the detected level of signal interference (**obtained by using an amount of load generated**) with a threshold value in order to estimate (determine) the load on the reverse link).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the combined teaching of Jain and Park by incorporating the teaching of Kim to control data transmission (transfer) rates between a base station and mobile stations served by the base station so that data throughput is advantageously increased (Kim; paragraph 1).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to STEVEN WOOD whose telephone number is (571)270-7318. The examiner can normally be reached on Mon. - Thurs. 8 - 5 (est.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema Rao can be reached on (571)272-3174. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/S.W./
April 10, 2009
Steven A. Wood
Examiner
Art Unit 2416

/Seema S. Rao/
Supervisory Patent
Examiner, Art Unit 2416